RESPOND AND REBUILD: FIGHTING EBOLA AND STRENGTHENING HEALTH SYSTEMS IN SIERRA LEONE

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OFDA CLOSEOUT REPORT

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1 CONTEXT AND BACKGROUND

1.1 Background on PIH's Ebola Response

Partners In Health (PIH) was asked by the Government of Sierra Leone (GOSL) to join the Ebola response in September 2014. Given the scale and degree of suffering caused by the Ebola epidemic in West Africa, as well as the potentially devastating health, economic, and political repercussions at the regional and global level, PIH accepted the invitation. While PIH is not traditionally an emergency response organization, PIH felt a moral obligation to join the response given the intense need in West Africa and the organizational expertise, skills and resources PIH had to offer. After witnessing the devastation already wrought by Ebola on initial visits to Sierra Leone in September 2014, PIH formally committed to join the response, at the invitation of the Sierra Leonean Ministry of Health and Sanitation (MOHS) and Wellbody Alliance, a local partner that has worked in Sierra Leone since 2006 providing essential health care services to over 20,000 patients a year.

PIH arrived in Sierra Leone at a time when the situation was worsening daily and there were very few external partners providing direct clinical care at Ebola treatment facilities. Within a matter of weeks, PIH rapidly transitioned from planning to implementation and scale-up of operations in Sierra Leone to address the growing needs of the population and help tackle an exponentially worsening Ebola virus disease (EVD) epidemic. Rapid scale up allowed PIH to have an immediate and sizeable impact across all four districts where it operated, and required systems building to sustain operations in the middle of implementation. While the challenges of doing so were considerable, this was a strategic decision that PIH took after careful consideration. To date, these systems continue to provide a solid platform for the health systems strengthening phase of PIH's work in Sierra Leone.

PIH's intervention in Sierra Leone was guided by the following principles:

- Partnership with the public health sector, even in the context of an emergency response, avoiding the creation of parallel systems whenever possible
- Maintaining the appropriate balance between quality, scale, and safety in all operations
- The need to be nimble, flexible, and adaptable and to go where the need is, while collaborating and coordinating with diverse stakeholders
- Comprehensive intervention across all levels of the health system (i.e., Ebola Treatment Units (ETUs), Community Care Centers (CCCs), and community-level engagement) to preserve the integrity of the health service delivery chain
- Continuity between emergency response and long-term health system strengthening, which PIH is committed to pursue for years to come in Sierra Leone.

1.2 Health and Protection Sector Assessment

Health Sector Assessment. In the absence of a formal needs assessment, a preliminary report titled "Sierra Leone Demographic and Health Survey 2013," authorized by the MOHS, provided up-to-date estimates of basic demographic and health indicators, including information on awareness and use of family planning methods, nutrition, childhood and maternal mortality, maternal and child health, and estimates on HIV prevalence among adult Sierra Leoneans. Although this assessment did not include information relating to Ebola, it provided background on the general health context in which the outbreak was situated, and provided important information for positioning our response within the broader public sector health system.

Overall, Sierra Leone had a weak health system even before the Ebola outbreak. Prior to the outbreak, Sierra Leone had only two physicians per 100,000 people, compared to 20 per 100,000 as the average for low-income countries.[1] The area targeted by PIH's program had an insufficient number of active government health workers, and those who were present had not been sufficiently trained. In addition, as noted above, Sierra Leone already had poor health-related indicators with a high under-five mortality rate (i.e., 156/1000 live births) and one of the highest maternal mortality rates in the world (i.e., 1165/100,000 live births).[2]

The existing health system was further weakened by Ebola. More than 200 health workers died from Ebola, and countless hospitals and health centers shut down. Health care providers abandoned their positions and went on strike due to a lack of medical supplies, personal protective equipment (PPE), and support needed to ensure their safety while serving the public.[3] Weaknesses in the existing primary health care system hindered the country's response to Ebola (i.e., education and outreach efforts, case finding, and contact tracing). Ebola derailed vaccination programs and maternal and child health programs, putting even more lives at risk.

Protection Sector Assessment. An essential component of comprehensively addressing the impact of this highly infectious disease was psychosocial support for survivors, communities, and health care workers. Ebola changed how impacted communities provided support to each other (e.g., the risk of caring for loved ones, engaging in traditional burials) and people were separated from their families due to illness or death. Health and front-line workers had to deal with a challenging workload and the stress associated with protecting themselves and their patients. Social stigma surrounding Ebola also worsened the impact. Ultimately, the fear and suffering caused by the outbreak affected entire communities. Finally, as noted above, almost all health facilities were closed or only partially functioning at the beginning of PIH's intervention, which created mental health stressors that further impacted Sierra Leoneans' overall sense of wellbeing and safety.

2 OVERALL PERFORMANCE OVERVIEW

With support from OFDA, PIH made a meaningful contribution towards controlling the outbreak of Ebola in Sierra Leone by supporting the adoption of safe isolation practices for suspected Ebola patients within a network of health facilities, and by undertaking expansive survivor

[1] https://www.hfgproject.org/resources/health-systems-database/country-profiles/sierra-leone/
[2] http://dhsprogram.com/pubs/pdf/SR215/SR215.pdf
[3] http://www.theguardian.com/world/2014/dec/09/ebola-crisis-sierra-leone-doctors-strike-inadequate-equipment

reintegration and support activities. The following section outlines some of PIH's core activities and major accomplishments in improving treatment and isolation at facilities and supporting Ebola survivors.

PIH's overarching program objective was to reduce transmission and morbidity of Ebola in Sierra Leone, through a response program focused in two sectors—health and protection. PIH's response focused on targeted interventions for containing and treating Ebola. PIH also supported Ebola preparedness at EVD-specific, primary, and secondary health care facilities, as well as case management and community re-integration for Ebola survivors. Specifically, PIH:

(2.1) Provided clinical management and operational support at 4 CCCs in Kono District (from January 2015 through December 2015) and 1 Holding Unit in Kambia District (from January 2015 through March 2015);

(2.2) Supported the Kono District Health Management Team (DHMT) to ensure the safe isolation and triage of patients, particularly as the district transitioned away from CCCs, through triage/isolation capacity building at 5 government health facilities (4 Peripheral Health Units (PHUs), 1 District Hospital);

(2.3) Supported the District Ebola Response Center (DERC) and DHMT in Kono District with mobile rapid response capacity, chiefdom-based advance surveillance teams, and district transition planning;

(2.4) Provided psychosocial services to communities and survivors in Kono and Kambia Districts to support recovery and reintegration by fostering stability after the outbreak.

2.1 CCCs and Holding Unit

In January 2015, PIH worked closely with the Kono DERC, DHMT, and UNICEF to establish 4 CCCs in Kono District. UNICEF constructed four CCC facilities in Condama, Fiama, Gbane, and Sandor chiefdoms. PIH clinical and operations staff collaborated with UNICEF and the DHMT in the construction and launch. In the first two weeks of operation, PIH provided intensive mentorship and support as the CCCs began operations.

Throughout the grant period, PIH provided clinical and operational oversight and mentorship, food and water, pharmaceutical and consumable supplies, and generator fuel to ensure the successful operations and management of the Kono CCCs. PIH also worked to respond to any quality assurance issues as they arose. Specific issues that were addressed included facility maintenance, human resource challenges, and continuous quality of care improvements.

Mobile PIH clinical teams conducted visits to the CCCs two to three times per week. Each visit involved a facility assessment, as well as refresher training in key areas. Clinical teams provided in-service training and mentorship to national CCC staff in areas such as screening and triage, infection, prevention, and control (IPC), PPE donning and doffing, medication distribution, and stock management. During facility assessments, teams noted any challenges faced and followed up as needed to ensure problems were addressed (e.g. teams facilitated repairs to water piping and roofing, and the addition of a more robust drainage system in advance of the rainy reason).

To ensure sufficient water for consumption by patients and staff, PIH hired a vendor who provided water sachets to the CCCs. For IPC and facility maintenance water supply needs, UNICEF assisted with renovating hand-dug wells in close proximity at the Fiama CCC. Community members were then hired to carry water from the pumped source to the facility. At

Gbane CCC, there was a piped water source. There were occasional challenges with this piped water source, which PIH assisted in repairing as quickly as possible.

The arrival of the rainy season in April presented several new challenges. Early rainstorms in late May damaged the roofing and electrical and lighting systems at Gbane CCC. This was repaired within one week by the PIH operations and facilities maintenance staff, but other weather-related damages impacted the water pumps at both Fiama and Gbane CCCs in June, which led to gaps in reliable water supply at these facilities. PIH prioritized these repairs and reallocated available resources quickly to repair the damage.

PIH followed accepted WHO standards for infection control. As detailed in previous reports, the CCCs were divided into no risk, low-risk, and high-risk zones. The high-risk zones required full PPE. Hygienists accompanied all care teams into the high-risk zone, and oversaw routine hygiene of the CCC area. PIH used WHO and MSF standards for chlorine footbaths, hand washing stations, chlorine sprayers, and routine hygiene throughout the facilities. PIH required CCC-grade rubber boots and scrub wear to be left at the CCC facility.

PIH partnered with UNICEF and WHO for technical support and to provide effective waste management to ensure that CCCs had sanitized, disinfected water sources and back-up water sources and tanks. Finally, PIH collaborated with UNICEF, WHO, and the DHMT to ensure decommissioning SOPs and national guidelines were followed in February 2015 and December 2015, during the decommissioning of all four facilities.

A major unforeseen challenge with the CCC management was the lack of clear national guidance on the isolation facility rightsizing plan. This guidance was needed to ensure an appropriate number of isolation facilities were available in communities nationally, and that the number and distribution of facilities was aligned to the evolving epidemiology of the outbreak. District leadership and partners were originally notified to prepare for closure of the CCCs by August 15, but this was extended a number of times (to August 30, then September 30, then October 31, then November 15, then December 1). The lack of clear direction and shifting timelines affected the morale and motivation of CCC staff, as frequent changes in messaging and planning regarding their job status led to feelings of insecurity and frustration. The reduced patient load and workload, due to facilities going unused for long stretches at a time, compounded staff frustrations from July through November. PIH continued to support CCC staff through this challenging transition period and communicated these challenges to decision-making bodies on a district and national level, while also ensuring ongoing quality assurance and the maintenance of all standards and procedures. PIH advocated with the National Ebola Response Center (NERC) and the MOHS for a more streamlined national policy regarding isolation capacity and district-level transition planning, including the closure of CCCs and transition towards supporting PHU preparation to take on EVD suspect triage, isolation, and referral capacity.

In Kambia District, PIH took over clinical management of the District's sole Holding Unit in January 2015. PIH closed the facility for one week and worked in close collaboration with the World Food Program, to rehabilitate the Unit through facility infrastructure improvements, improved infection prevention and control layout, and an increased stock of medical and non-medical supplies. PIH's clinical management team worked to significantly improve the quality of care at the facility by implementing more aggressive case management (e.g. IV fluid

resuscitation, electrolyte management, and empiric antibiotics and anti-malaria treatment) as patients awaited their PCR test results. For security and operational efficiency reasons, PIH did not maintain permanent staff in Kambia, but supported the Kambia Holding Unit with roving clinical teams based out of Port Loko. PIH staffing constraints in Port Loko District, our operating base for support for Kambia, led to occasional reductions in clinical oversight at Kambia Holding Unit. PIH clinical management and quality assurance teams provided support 3-5 days per week. This was eventually scaled up to support seven days per week. In March 2015, the Kambia DERC requested PIH further increase its presence to provide clinical care at the center 24/7. At that time, PIH did not have sufficient expatriate clinical staff in country to significantly expand our presence at the Kambia Holding Unit, and thus we worked with OFDA to identify an alternative partner to takeover clinical management of the facility. At the end of March, PIH handed over clinical management to International Medical Corps (IMC), who converted the Holding Unit into a full Ebola Treatment Unit with expatriate clinical oversight 24/7. PIH and IMC worked together to communicate to staff, coordinate with social mobilization partners to communicate the change to communities, and to take a full inventory as part of the handover.

2.2 Triage and Isolation Support at Public Facilities

Upon the closure of two CCCs February 2015 and two in December 2015, PIH supported the establishment of triage and isolation functions at PHUs adjacent to the closing CCCs, to ensure these remote communities maintained triage and isolation capacity. This transition was successfully executed to align with the evolution of the district and national Ebola response, in alignment with the evolution of the epidemic and shifting needs on the ground.

Upon closure of the Condama and Sandor CCCs in February 2015, PIH built temporary triage and isolation structures at PHUs nearest to the closing CCC facilities. PIH provided supplemental staff and clinical training and operational support visits two to three times per week through August 2015, before the MOHS took full stewardship of their management and operations.

In Fiama and Gbane, per the request of the Kono DHMT and DERC, PIH mobilized private (non-OFDA) resources to construct permanent additions to the nearest PHUs so they had permanent isolation capacity. PIH began regular visits to the PHUs for training and capacity building in September to ensure staff were ready to take full ownership of enhanced triage and isolation capacity by December 2015. The MOHS took full stewardship of their management and operations in December.

At all four PHUs in Kono, PIH collaborated closely with the International Rescue Committee (IRC), who provided IPC support. While IRC provided support for screening capacity, PIH's more intensive triage and isolation support to these four PHUs helped IRC to address the heavier patient burden and unique challenges they experienced due to their proximity to the closing CCCs.

PIH also built a temporary triage and isolation unit at Koidu Government Hospital (KGH) in January 2015. KGH is a 165-bed hospital, and is the only public hospital in a district of approximately 500,000 people. PIH has managed this semi-permanent triage/isolation unit at the

hospital since January 2015, which has ensured that no patients meeting EVD case definition have entered the hospital until they have tested Ebola-negative.

Upon closure of the Red Cross ETU in Kono in November 2015, the hospital isolation unit became the primary isolation center in the district. This isolation unit currently has an eight-bed capacity and, in case of a surge, can accommodate 16 total beds. While awaiting the completion of the UNOPS permanent screening unit at KGH, PIH will continue to staff and supply the temporary triage and isolation unit. As of December 2015, the unit triaged an average of 79 patients per day and isolated and referred an average of four patients per month who met EVD case definition. The triage and isolation staff have all been trained in IPC and care of EVD suspects, and their work is overseen by two international staff (i.e., one nurse and one physician), who provide supervision, management, and guidance on patient care, as well as regular refresher training.

Establishment of a high-quality triage and isolation unit has been an essential step in restoring confidence in the hospital and facilitating the restoration of services, while protecting staff and patient safety.

2.3 District Response Management Support and Capacity-Building: Rapid Response, Surveillance, and Transition Planning

PIH remained nimble and flexible in our response, working closely with the DHMT, DERC and the OFDA DART team to fill key gaps in the EVD response as needed. Over the course of the year, PIH was asked to support three additional areas of work in the Kono District response—rapid response, surveillance, and transition planning.

Rapid Response: Through partnership with the Kono DERC and the MOHS, PIH, as part of a multi-disciplinary team, responded to small outbreaks throughout the district. PIH developed priority staffing arrangements for all facility and mobile response needs each week. For example, the utilization of a Rapid Response Coordinator was essential in monitoring rapid response needs, overseeing the operations, directing staff appropriately, and supporting the DERC and other partners.

The rapid response support also included mobilizing experienced and qualified clinical staff, coordinating logistics support for mobilization of supplies, and helping DHMT coordinate activities of partners engaged in case investigation and other key functions. Additional support included training for rapid response staff on topics such as clinical management in remote settings, safety and operational planning, field PPE donning and doffing, safe management of sharps, field management of wastes, medication administration, situational awareness and risk assessment, communications, safety on steep/unstable ground, and water safety. Trainings were provided at multiple locations and upon the successful completion of the training, written and practical field exercises were conducted periodically to ensure that skills and effectiveness were maintained.

Surveillance: In January 2015, the Kono DERC/DHMT established advance surveillance teams in Kono's 14 chiefdoms. PIH was asked to support these advance teams in five chiefdoms (i.e., Kamara, Sandor, Nimiyama, Gbane, Fiama**).** PIH hired, trained, and funded five Advance Surveillance Teams. These five-member teams, embedded in the chiefdoms, remained ready at

all times to assess households with suspect cases in advance of the arrival of a centrally dispatched alert team.

In addition, PIH provided salary support for 37 DERC Surveillance Officers, who served in a range of essential disaster response roles. These Surveillance Officers reported through the DERC pillar structure and were managed by DERC leadership, with support from PIH.

District Transition Planning: Kono District had its last Ebola case in February 2015. While remaining vigilant and working hard to maintain a resilient zero, the district also had more lead time than many other districts to begin to think through transitioning from an outbreak response to longer-term systems resiliency.

Transition planning from NERC management to MOHS and Office of National Security-emergency response leadership was repeatedly delayed. In the midst of these delays and ongoing ambiguity on a national level about transition plans and guidelines, PIH supported the Kono DERC and DHMT to engage in a critical reflection and planning process that helped to identify ongoing response/readiness needs in Kono and evaluate potential organizational arrangements to meet these needs after the NERC and the DERC closed out in December 2015.

PIH's Operations Director and Kono Clinical Lead helped to guide the process with significant support from 2 national Health Policy Assistants and a PIH Monitoring, Evaluation and Quality Officer. The team, working closely with the DERC Chief of Staff, DMO, District Sister and other district leadership, ultimately produced a 115-page report with policy recommendations and SOPs for the transition. The report was printed and distributed to senior district leadership.

During review of this report by district leadership and technical partners, a standardized national process was undertaken in late December 2015 and January 2016 to facilitate the transition across the country. Recommendations and lessons from the PIH-supported Kono transition planning report were incorporated into Kono's final transition plan.

2.4 Survivor Psychosocial and Reintegration Support

Psychosocial support has been a cornerstone of PIH's program in Kono and Kambia. In Kono, within 24 hours of admission to a CCC, each patient was visited by a psychosocial worker, who did an assessment and followed up with the patient's family or home community to ensure they knew the patient's whereabouts and status. Complex cases were referred to the District Mental Health Nurse, who was supported by PIH's Senior Psychosocial Nurse.

PIH also built a comprehensive program for Ebola survivors in Kono and Kambia Districts. EVD survivors continue to experience serious medical and psychosocial challenges in the weeks and months after their release from treatment centers. PIH's psychosocial support program for EVD survivors, which included referrals for clinical care related to sequelae of EVD (to PIH-supported survivor clinic in Port Loko District), as well as psychosocial support and referrals, was highly utilized throughout the project period in both Kono and Kambia Districts.

PIH's network of Survivor Case Managers and Social Support Officers played a critical role in delivering psychosocial support to EVD survivors in Kono and Kambia Districts, ensuring they had access to services, were accompanied in referrals, and were seeking support when struggling with reintegration in their communities. Community-based Survivor Case Managers, all

survivors themselves, conduct home-based visits for each survivor in their catchment area once per month and ensured that anyone feeling ill or depressed is referred to clinical facility-based services as needed.

Over the course of 2015, Survivor Case Managers helped to ensure that 100% of survivors in Kono and Kambia Districts were screened for eye symptoms and those diagnosed with uveitis, a common Ebola sequelae that can lead to blindness, were treated and followed up through completion of their treatment course, which can take up to three months or longer. In Kono, 81 survivors were screened, with 8 diagnosed and treated for uveitis. In Kambia, 53 survivors were screened, with 10 diagnosed and treated for uveitis.

PIH Case Managers identified survivor children and children of survivors in need of support in getting back to school. Case Managers facilitated referrals to PIH's back to school program, which provided school supplies, uniforms, and nutritional support to children in need. Case Managers then followed up to ensure regular attendance and to support in addressing other challenges. In total 210 school children (20 in Kambia, 190 in Kono) received comprehensive back to school packages and continuous follow up.

Survivor Case Managers also referred survivors into PIH's adult literacy program. Participation in these classes has helped reconnect survivors into their community and is seen as the first step in improving their socioeconomic mobility. In Kambia, 15 adult learners and 52 adult learners in Kono received a school package of supplies and received continuous follow up during their enrollment, including verification of attendance with school administrators.

2.5 Project Management and Coordination Approach

The identified management team regularly monitored the progress of each deliverable and task and employed all necessary steps to ensure that PIH was able to meet deadlines, coordinate effectively with partners, and troubleshoot problems. The management team worked to maintain flexibility as both the outbreak and response strategies shifted, while ensuring strong IPC practices throughout all interventions and providing care for patients and affected populations with the highest quality care possible. This section reviews PIH's organizational structure and staffing that supported these activities and our close coordination with project partners and stakeholders.

Led by the Executive Director (Dr. Corrado Cancedda for January-June 2015, and Dr. Kerry Dierberg July-December 2015), and supported by PIH's Boston-based Executive Leadership, PIH Sierra Leone assembled a highly qualified team to deliver on our core objectives and outputs. PIH built out our leadership structures at a district and national level with additional layers of clinical and operational support and oversight provided for all programs and staff.

As described earlier, PIH scaled up work in Sierra Leone very quickly. As PIH built the program, the team strived to maintain the critical balance between quality, scale, and safety. PIH worked to scale up our clinical team as rapidly as possible, through the recruitment of cohorts of short-term clinicians serving six-week terms. The recruitment of longer-term management staff took longer than PIH anticipated and there were some periodic gaps in our management structure. Challenges arose from the constant churn of short-term clinicians without enough long-term staff and leadership to provide continuity; PIH thus decided from March 2015 onwards to focus exclusively on the recruitment of staff who could make a minimum

commitment of three to six months. As of April, there was also more stable, long-term clinical and operations leadership in place at the district level.

As much as possible, PIH leadership pulled staff from other country sites to respond to needs and gaps in staffing, including logisticians, security experts, and supply chain managers. A high priority was placed on ensuring our team had the necessary supplies to maintain safe working environments (e.g., PPE, chlorine, potable water).

PIH's response in Sierra Leone was founded on strong partnerships and coordination with district- and national-level MOHS and Ebola emergency response bodies. This included district-level health officials, as well as national MOHS leadership and established emergency response mechanisms, including the NERC, DERCs, and United Nations Mission for Ebola Emergency Response (UNMEER). The PIH team attended the regular Ebola response coordination meetings and working groups held by the NERC and MOHS to ensure broader coordination, dissemination of lessons learned, and the receipt of guidance on the evolution of the national Ebola response strategy. This included PIH participation in daily DERC meetings in Kono and Kambia, as well as the NERC pillar meetings in Freetown on case management, logistics, surveillance, and social mobilization. PIH established a memorandum of understanding (MOU) with the NERC that confirmed PIH's intent to partner with the MOHS on the Ebola response in target areas in Sierra Leone and finalized an attestation with the MOHS affirming our continued partnership in March 2015.

PIH leveraged its experience working in remote areas to help minimize the challenges of procurement and supply delivery. PIH worked closely with the MOHS, World Food Programme (WFP), Plan International, International Federation of Red Cross and Red Crescent Societies (IFRC), UNICEF, and other stakeholders to update proposed timelines as needed to ensure rapid response to those most in need. A key component of streamlining programmatic logistics was working with the DERCs and DHMTs to support the coordinated Ebola response and minimize redundancies.

In our CCC work, PIH partnered with UNICEF. PIH's operations, supply chain, and logistics teams coordinated closely with UNICEF to ensure these facilities maintained effective water, sanitation, and hygiene management; a robust supply chain; and three meals per day for all patients and staff. In all facilities, PIH worked closely with the CDC and WHO, who provided regular IPC assessments to ensure the highest standards were being maintained and to provide feedback on how to continually improve practices.

3 M&E INDICATORS AND ANALYSIS

The following section outlines some of PIH's major outputs and accomplishments, measured within the agreed upon M&E framework, and identifies areas where targets were exceeded, as well as areas that were challenging.

With support from OFDA, PIH made a meaningful contribution towards controlling the Ebola outbreak in Sierra Leone by supporting the adoption of safe isolation practices within a network of health facilities, and by undertaking expansive psychosocial outreach and support activities for survivors. As described in the previous section, PIH's scope of work under this program evolved significantly over the course of the year. The M&E indicators selected before the program period began did not always fully reflect the full scope of work. PIH worked with

OFDA to update the framework, and add in additional indicators over time to better capture our outputs and achievements. Below each indicator table are a few explanatory notes regarding areas where PIH exceeded or fell short of targets, as well as some comments on indicators that presented a particular challenge.

3.1 Health Sector

SUB-SECTOR 1: HEALTH SYSTEMS AND CLINICAL SUPPORT					
	Indicator description	*Source*	*Base-line*	*Target*	*Cumulative*
Indicator 1:	Number of health facilities supported and/or rehabilitated by type.	Organizational records	0	8 (4 CCCs; 1 Holding Unit; 3 isolation and triage units at public health facilities)	10 (4 CCCs in Kono, 1 Holding Unit in Kambia, 1 Government Hospital, 4 PHUs)
Indicator 2:	Number of health care providers trained by sex, provider type, facility type by sex, provider type, facility type.	Training register	N/A	154 (supporting safe isolation, triage, IPC, and supportive care)	Total: 109 5 Doctors: 5 M/0 F 7 CHOs 1 M/6F 77 Nurses: 11 M/66 F 1 Midwife: 0 M/ 1 F 19 TBAs: 0 M/19 F *PIH also trained 131 non-clinical staff (social workers, lab technicians, sprayers, cleaners, cooks, laborers, security, and others).
Indicator 3:	Number of health centers submitting weekly surveillance reports	Ministry of Health HMIS	0	100%	6 (100%)
Indicator 4:	Number/Percentage of probable/ suspected/confirmed Ebola cases referred from community health workers to ETU and CCCs	CCC patient register	N/A	100%	Total: 169/4.7% Kono: 169 (of 3633 triaged at CCCs)/4.7% Kambia: Not measured (no PIH CHW program in this area).
Indicator 5a:	Number of patients triaged at CCCs, disaggregated by suspected vs. confirmed cases	CCC patient register	N/A	895+	Total Triaged: 3405
Indicator 5b:	Number of suspected/probable cases tested for Ebola at CCC, disaggregated by positive or negative result	CCC patient register	N/A	154 (TBD % negative)	Total Tested: 154 (Kono); 114 (Kambia) Total Positive: 0 (Kono); 41 (Kambia) Total Negative: 154 (Kono); 62 (Kambia) Total Unknown: 11 (Kambia)

Indicator 5c:	Number/Percentage of confirmed Ebola patients admitted to CCC isolation ward, disaggregated by age category and gender	CCC patient register	N/A	41/ 100% of confirmed patients	Kono: N/A Kambia: 41/100%
Indicator 6:	Number/Percentage of Ebola patients discharged healthy from CCC, disaggregated by age category and gender	CCC patient register	N/A	52% of patients discharged healthy (53% female)	Kono: N/A Kambia: 0/0% (all transferred to ETU)
Indicator 7:	Number/Percentage of Ebola patients who left CCC against medical advice, disaggregated by age category and gender	CCC patient register	N/A	0/0%	Kono: N/A Kambia: 0/0%
Indicator 8:	Number/Percentage of Ebola patients who died at CCC, disaggregated by age category and gender	CCC patient register	N/A	48%	Kono: N/A Kambia: 12.2% (5 out of 41 EVD patients) 5-14 yrs: 0 M / 1 F 15-49 yrs: 2 M / 1 F 60+ yrs: 1 M / 0 F

PIH targeted 8 facilities, but ultimately supported 10 per the request of the Kono DERC and DHMT. PIH excluded PHUs in our quarterly reports, but has added them to the final report because the PHU numbers more accurately capture the full scope of the team's OFDA-funded EVD response.

PIH conducted weekly in-service and monthly refresher trainings for all clinical and non-clinical triage and isolation facility staff. The program trained fewer than the initial target number of clinical staff, as there were ultimately fewer clinical staff required and less turnover at the facilities than initially anticipated. While PIH trained 109 clinical staff (doctors, CHOs, nurses, midwives, traditional birth attendants), we also trained 131 other staff serving in the triage and isolation facilities (including social workers, lab technicians, sprayers, cleaners, cooks, laborers, security, and others), for a total of 240 facility-based staff trained under the program.

The program significantly exceeded the triage targets, largely because CCCs in Kono were kept open longer than anticipated, ultimately triaging 3,405 patients, rather than the target of 895.

Facilities experienced a high volume of patients in Q1 and Q2 (1809 and 1403 respectively), but there was a very significant decrease from Q3 onwards, as the number of positive cases diminished across the country, and consequently so did the number of suspect patients presenting at CCCs, rather than at regular health facilities.

The number of Ebola patients discharged healthy from CCCs (Indicator 6) was listed as N/A for both Kono and Kambia for the entire reporting period, as the CCCs and the Holding Unit were not used as treatment facilities; as soon as a patient tested positive for Ebola they were immediately transferred to an ETU.

PIH's original proposal to OFDA included a request for support for an EVD CHW program, hence the inclusion of indicator 4 on CHW referrals. Ultimately PIH worked closely with partner organization Wellbody Alliance's Ebola Community Health Worker program, which mobilized a network of 400 CHWs to conduct home-based surveillance and social mobilization in Kono District; support to PIH for CHW work was removed via a modification in early 2015. Of all patients presenting at the CCCs, 4.7% came via referral by Wellbody CHWs. PIH tracked this indicator based on self-reporting by the presenting patient, but we did not manage CHWs directly under the scope of this grant, thus we did not track whether every patient that a CHW encountered in a community that required referral actually presented at a CCC. While CHWs played an essential role in community engagement at the CCCs, 100% was not the appropriate target for this indicator, given the evolution of the program.

Because there was never a positive Ebola patient at any of the Kono CCCs, indicators 5C through indicator 8 are listed as N/A for Kono. Kambia figures for these indicators cover PIH's clinical management of the Holding Unit from January to March 2015.

SUB-SECTOR 2: MEDICAL COMMODITIES INCLUDING PHARMACEUTICALS					
	Indicator description	*Source*	*Baseline*	*Target*	*Cumulative*
Indicator 1:	Number/Percentage of supplies distributed by type	Supplies inventory form	0	Medical/non-medical supplies and equipment	13 medical kits, 51 equipment, 51601 consumables
Indicator 2:	Number of people trained, disaggregated by sex, in the use and proper disposal of medical equipment and consumables	Training register	0	75 people trained in proper use of medical equipment; 50 trained in proper disposal	Total: 0 0 M/0 F
Indicator 3:	Percentage of health facilities, supported by USAID/OFDA, out of stock of selected essential medicines and tracer products for more than one week.	Supplies inventory form	N/A	5%	Total: 0

From Q2 to Q3 there was a significant spike in the number of equipment (1 to 13) and consumables (26 to 43,386) available. Given improved process and tracking implemented in Q3,

PIH was able to report more precisely the amount of consumables and equipment distributed. Moreover, the shift to consumables and equipment was made to provide more insight into the volume of supplies that are being used once and disposed of versus those that are typically reused.

The cumulative number of people trained in the use and proper disposal of medical equipment and consumables is listed as 0. However, from Q1-Q3 we reported that a cumulative of 141 individuals were trained (Q1: 62; Q2: 44; Q3: 35). These figures were estimates based on staff trained on a range of topics, including the use of medical equipment and consumables, but is not number of staff enrolled in a specific training program on use and proper disposal of medical equipment and consumables. There was no formal PIH training curriculum for staff on disposal and decommissioning, and only a small number of staff were involved in the supply redistribution and decommissioning process. The WHO, rather than PIH, was responsible for decommissioning training.

The percentage of health facilities out of stock of selected medicines and tracer products for more than one week was 0%. As patient volume decreased, the amount of decentralized supplies decreased to maintain security and oversight, but all essential supplies were available to CCCs within a 12-24 hour timeframe, if not already on site. Furthermore, the list of tracer products lost relevancy over time, as protocols changed. For example, protocol changes from spraying to wiping led to sprayers no longer being stocked at CCCs.

3.2 WASH Sector

WASH FOR CCCs			
	Indicator description	*Source*	*Cumulative*
Indicator 1:	Percentage of days that contaminated objects/surfaces (laundry, floors, foot baths, etc.) are disinfected with a chlorine solution following guidance from Annex 12	WASH Forms	97.2% (423/435)
Indicator 2:	Percentage of days that all contaminated liquid wastes (vomit, blood, feces, urine, etc.) are disinfected and disposed of in a designated, secured location.	WASH Forms	98.4% (428/435)
Indicator 3:	Percentage of observations of Handwashing Stations where water and soap were both present.	WASH Forms	98.4% (428/435)
Indicator 4:	Percentage of days in which 250 Liters of water per staff per day were available at the CCCs	WASH Forms	85.5% (372/435)

Indicator 5:	Percentage of days in which 2 days of buffer water storage were maintained at the CCCs	WASH Forms	79.3% (372/469
Indicator 6:	Percentage of drinking water samples from the CCCs which had a minimum of 0.5 mg/L (ppm) free residual chlorine (FRC)	WASH Forms	0% *
***Sites are not water tested because they have sanitary water provided by a closed plumbing system – water was tested before installation of system and thus made regular sampling and testing unnecessary**			

Although WASH was not a specific focus sector of this program, WASH was an essential part of operating safe high-quality triage and isolation facilities, thus per OFDA's request, PIH incorporated several WASH indicators within the M&E framework. Routine data collection for WASH indicators began in May 2015.

Due to weather-related damages, the water pumps at Fiama and Gbane CCCs were broken during the reporting period, causing results for some indicators to fall short of their target. The pump at Fiama broke the first week of June and was repaired the week of June 21st. The pump at Gbane broke the week of June 21st and was repaired the following week.

The percentage of drinking water samples from the CCCs which had a minimum of 0.5 mg/L free residual chlorine was listed as 0%. Sites were not water tested because they had sanitary water provided by a closed plumbing system – water was tested before installation of system and thus made regular sampling and testing unnecessary.

3.3 Protection Sector

SUB-SECTOR 1: PSYCHOSOCIAL SUPPORT SSERVICES					
	Indicator description	*Source*	*Baseline*	*Target*	*Cumulative*
Indicator 1:	Number of people trained in psychosocial support, disaggregated by sex/provider role	Training register	0	3 Social Workers and 10 survivors trained as Case Managers/Supervisors	Kono: 136 psychosocial support CHWs (M: 100; F: 36) Kambia: 0
Indicator 2:	Number/Percentage of survivors reintegrated into communities	Survivor form	N/A	148	134
Indicator 3:	Percentage of Social Workers and Case Managers perceiving an improved social connectedness in survivors served (new indicator)	Case Manager Survey	N/A		21.4%

PIH exceeded our target of training 13 staff in psychosocial support, as we ultimately trained 136. The initial target of 13 was low, but during the response we determined that there was a tremendous need to train everyone, especially CHWs, who proved critical to providing psychosocial support services to survivors.

PIH supported all known survivors in Kono and Kambia Districts through our social protection program. The original target number of 148 was based on early estimates of the number of survivors in these districts, which were overestimates. The number of survivors reintegrated was originally defined as the number of survivors employed by PIH. This indicator unfortunately does not fully capture the value added of our program. Many additional survivors, beyond just those employed by PIH, were supported in reintegration.

Starting in Q3, PIH introduced a new indicator: Percentage of Social Workers and Case Managers perceiving an improved social connectedness in EVD survivors served. PIH's M&E team developed a survey in which our Case Managers, themselves survivors, were surveyed on different aspects of social connectedness among survivors and then scored accordingly. These questions asked if the Case Manager thought that survivors, post-Ebola, felt connected to their family, friends, or the community. The majority of Case Managers said that they thought survivors did not feel connected at all or only to one another, as they were often ostracized or still acutely felt the loss of family members. The low agreement rates reflect ongoing challenges with survivor social connectedness.

4 COST EFFECTIVENESS

PIH designed the implementation of our response through a human rights-based framework that prioritized the integration of emergency interventions in an effort to strengthen entire health systems and investments in the staff, stuff, systems, and spaces needed to effectively respond. This model enabled PIH to avoid the creation of parallel systems whenever possible, while supporting the preservation of the health service delivery chain and building resilience and future preparedness in the public health sector.

While recognizing the inherent benefit in incorporating cost effectiveness considerations, the nature of humanitarian crises presents challenges in assessing and evaluating its principles and approaches. PIH designed and implemented its EVD response in Sierra Leone to help ensure an economic, efficient, and effective approach to achieving the desired outcomes. These outcomes, however, are difficult to quantify and assign a "value" from the perspective of a unit cost analysis, as success in PIH's model is predicated on effective prevention efforts and community outreach. Efficiency for this project can be defined as a measure of how well PIH's inputs, such as human resources and capital, were converted into outputs, namely the capacity to undertake community prevention and outreach activities. A measure of the effectiveness of these outputs is the success PIH experienced in reaching the most remote communities, preventing the spread of EVD through continuous outreach and educational campaigns, and ultimately restoring confidence in the health care system.

In an effort to ensure that activities represented the greatest value possible, PIH established strong partnerships with a number of implementing partners and stakeholders to streamline programmatic logistics and to overcome the challenges presented by procurement, and supply chain coordination. PIH provided supplemental personnel and supplies to support overall operations, and developed a budget that was coordinated and aligned with partner efforts. Strategic supply supplements included providing a buffer stock of supplies critical to providing appropriate health service delivery and quality assurance across the network of supported facilities. These buffer stock supplies included PPE, infection control supplies, and basic medicines to ensure the highest quality assurances at PIH-supported facilities, and protect against general stock-out concerns and local supply chain constraints. Utilization of this buffer stock was overseen by PIH clinical program leadership and logistics team, and this strategy allowed PIH to build a model of staff, supplies, and systems that enabled a nimble and efficient response to the evolving situation on the ground, and the capacity to shift resources and clinical expertise as needed to respond to gaps and allocate funding to the greatest needs.

Total expenditures for the project were $5,461,489. Taking into account the line item flexibility, these expenditure were within the overall budget for the project. PIH was somewhat underspent on the training budget line, as most trainings were conducted by PIH's expat clinicians whose time was budgeted in the salaries budget line. Travel expenses for international short term clinicians were lower than budget, as fewer short term clinicians were required towards the end of the project, and as PIH moved towards longer-term contracts for Sierra Leone based clinicians. Salaries were higher than budget as the project needed more contract staff then we originally anticipated to execute the activities and to achieve project objectives. Equipment costs were higher compared to budget mainly due to the shortage of equipment in place in facilities as well as the lack of local availability, requiring PIH to import much of the equipment used in the response.

Cost efficiencies were largely due to implementation monitoring, strong financial controls and adherence to OFDA and PIH's guidelines on project implementation. Transparent financial and procurement processes were implemented at all sites and expenditure review and authorization process were managed by professionally qualified and trained staff. PIH organizes an annual external audit and accordingly the internal checks are suitably designed to prevent, detect and report fraud and conflict of interest. Accounting for the project was done within the specialized financial management software (Serenic), which uses separately identifiable fund codes to record transactions and generate transactions reports for periodic financial reports for the project.

5 LESSONS LEARNED AND BEST PRACTICES

PIH strives to constantly improve and better serve our patients, partners and employees. In the midst of the immense challenges faced in responding to this crisis, our team has considered the appropriateness of different models of care and our approach, as well as lessons learned for future emergency and non-emergency work in Sierra Leone. To this end, PIH actively sought feedback from stakeholders to round out this analysis.

Overall, the stakeholders working with and for PIH (e.g., expatriate clinicians, CCC staff, community chiefs, community members, EVD survivors and district leaders) had very positive feedback about PIH's work. Everyone was proud to have worked with PIH and noted that our

approach always put the patient first, even during very chaotic and challenging times. This section identifies challenges and lessons learned around staffing (Section 5.2), scale-up management (section 5.3), coordination with partners (Section 5.4), engaging EVD survivors (Section 5.5) and flexibility and responsiveness (Section 5.6).

5.1 Beneficiary Feedback

PIH leadership is committed to collecting and analyzing beneficiary feedback to understand and incorporate beneficiary views and perspectives into ongoing quality improvement (QI) initiatives. During program implementation, PIH collected one-way feedback from beneficiaries, with key points immediately shared with the leadership team for ongoing program improvements. For this final closeout report, PIH collected additional qualitative information from beneficiaries, including district-level stakeholders, EVD survivors, leaders in communities served, staff trained and supported by PIH, and patients screened and/or treated at one of our supported facilities.

Throughout the period of performance, PIH conducted one-on-one interviews with clinicians, and in February 2016 our team used a combination of stakeholder meetings and interviews to collect broader views to supplement the data presented in this report, identify successes during the response, and identify ways to improve our programs in the future. Specifically, our team conducted a series of one-on-one and small group semi-structured interviews with EVD survivors, former CCC staff, current MOHS facility staff, and PIH employees. While acknowledging that all partners were chasing the epidemic and often behind the curve at the beginning, overall the team thought that PIH performed well and built significant IPC knowledge and skills among staff. Additional valuable feedback is incorporated in the sections below.

5.2 Staffing

While this closeout report reviews a program that has ended, stakeholder feedback ensures that lessons learned will benefit future programs and ongoing PIH operations in Sierra Leone and our other country teams. Stakeholder feedback sessions and ongoing community conversations and discussions throughout the project were essential to capturing the compelling stories of the community members affected by the outbreak. See below for some stories that illustrate the success achieved and direct position effects of the program and efforts made by PIH.

Umaru Barrie, EVD Survivor and Social Support Officer

According to Umaru, his enrollment in PIH's psychosocial program was critical for him to adjust to life post-Ebola. Umaru, along with his fellow survivors all experienced pain and frustration of losing family members due to Ebola, and two of Umaru's colleagues were so overcome with grief and depression that they committed suicide. Through psychosocial counselling, he and his colleagues were able to recover from the pain, shame, and stigma associated with being a survivor of Ebola. Umaru also benefited from the 24-hour phone line; if any survivor was discriminated against, a psychosocial worker would immediately show up and sensitize the community to dispel any sort of stigmatization. According to Umaru, PIH's intervention and acceptance of survivors were critical to educating communities and dispelling discrimination of survivors.

Alex J Momoh, PHU and KGH Triage/Isolation Staff

Before the Ebola response, primary healthcare workers had not been educated about IPC. Materials like gloves, aprons, and face shields were not available at health centers. Waste management was also a huge problem at PHUs. According to Alex, PIH's intervention in the form of IPC trainings and the institution of supply-chain systems for drugs and equipment dramatically improved conditions at the PHUs. IPC training was offered to everyone from nurses to sprayers. The trainings instructed health facility workers on how to screen patients properly, use PPE properly, handle blood samples and medications, and how to dispose of waste safely. By honing the skills of the healthcare staff, the community's confidence in the healthcare facility has been restored.

Mariama Kamara, EVD Survivor and Social Protection Case Manager

Prior to the Ebola outbreak, Mariama lived a normal life as a mines monitoring officer with no educational background. She is an Ebola survivor and upon discharge from the ETU she decided to enroll in the PIH Survivors Program, because "to survive Ebola is one thing, to also survive beyond discharge is another." She assisted PIH with social mobilization and sensitization campaigns to help advocate hand washing, safe burial practices, and sharing the 117 emergency hotline number with community members. The Le 500,000 stipend that she received for her services, along with the sense of purpose that her job gave her, helped put her life back together. Furthermore, Mariama benefited from the psychosocial support provided by PIH-sponsored activities with friends and colleagues. In addition, prior to PIH's intervention, Mariama was illiterate, but thanks to the adult literacy program she can now confidently fill out survey forms for her patients. By day she is a Case Manager, but by night she attends classes in hopes of someday attending university.

As noted above in Section 2, PIH assembled an experienced and highly qualified team to respond to the EVD outbreak in Sierra Leone. However, there were some ongoing challenges in working with short-term expatriate clinical staff, as well as the MOHS facility-based employees. First, while the six-week rotations for clinicians were in place to protect short-term staff from burnout, the rapid turnover challenged PIH from the human resources (HR) perspective. PIH, as an organization, is not designed to recruit, on-board and off-board that quantity of staff within a short period of time, which led to logistical challenges for the HR department. In addition to the short-term staff, PIH also had challenges managing MOHS employees. Because PIH had no hiring or firing capabilities with MOHS-employed staff, even in facilities PIH was managing, it was difficult to ensure the right mix of skills, or remove underperforming staff from facilities.

While PIH was limited in our ability to fully resolve these staffing challenges during the height of the response, leadership worked to implement internal mechanisms to ensure the highest level of staff safety and coordination possible. Internally, PIH collected staff feedback at daily clinical check-ins and weekly roundtables. Ongoing QI initiatives included improving clarity of roles and

responsibilities, identifying approaches for rapid and timely team communications (e.g., listserves, newsletters, alerts), building systems for providing routine updates, and ensuring streamlined email communication with clear and consistent messaging. PIH will continue to utilize these processes to support streamlined communication with MOHS staff and our own employees.

Although working in facilities operated by another entity (in this case the MOHS) came with challenges, it also meant PIH invested even more heavily in training and supporting MOHS staff. This training and capacity building for MOHS staff will be retained in the MOHS workforce and will hopefully be applied to future response and readiness activities as those staff return to their regular jobs. Working side-by-side to provide clinical care, logistical support, and strategic decision making about facilities helped build greater solidarity between PIH and MOHS colleagues and pushed PIH staff to take advantage of opportunities for capacity building on a daily basis.

Challenges with staff retention were discussed during the feedback sessions, during which stakeholders shared important and informative suggestions. The challenges discussed in these sessions included lack of sufficient accommodations for CCC staff and the need for ongoing staff development training and social support.

5.3 Scale-up Management, Operations, and Closures

As noted above, PIH is not an emergency response organization, but was called to join the response, given the intense need in West Africa and our organizational expertise, skills, and resources. Though PIH has faced numerous emergencies in Haiti over the past thirty years, such as the 2010 earthquake, PIH did not have experience implementing an emergency response in countries where PIH has never worked before. PIH had never worked in Sierra Leone or West Africa more broadly, and had not launched a major health initiative in a new country since 2007. The response, therefore, posed a number of management challenges.

During the response, PIH employed a flexible management approach to allocate personnel to projects as needed, ensuring that our organization could effectively respond to hotspots as they emerged, while maintaining high quality standards for clinical care, safety and IPC. With our support staff in Boston, PIH had some redundancy built in to support project management, but bandwidth still became an issue given the aggressive need to scale-up. To support field staff, PIH Boston-based leadership held daily meetings with field leadership to catalogue and respond to challenges with staffing, recruitment of clinical and operations staff, travel, supply chain, and other issues as they arose. Boston leadership also made frequent trips to Sierra Leone to backfill and support staff, meet with partners, and strategize on next steps. The Boston leadership team included clinical, logistics, and supply chain experts.

In addition to the rapid scale-up and unprecedented EVD outbreak, PIH also had to consider how to balance our principles of accompaniment, working closely with the public sector, and the need to make decisions quickly to mobilize resources and respond. PIH continued to manage this dynamic throughout our Ebola response. That said, PIH believes it was this partnership and accompaniment approach that has enabled PIH to rapidly transition into a long-term health systems strengthening response in close partnership with the MOHS and DHMTs.

As noted above, for this final closeout report, PIH collected additional qualitative information from beneficiaries, including district-level stakeholders, EVD survivors, leaders in communities

served, staff trained and supported by PIH, and patients screened and/or treated at one of our supported facilities. During the stakeholder meetings, it was noted that leadership in Kono District was pleased about when the CCCs were closed. The chiefdom leadership, on the other hand, felt that the facilities should have been kept open longer, or converted into permanent isolation centers or multi-use health care facilities after they were decommissioned as EVD facilities.

Throughout the response, an ongoing challenge was reinforcing the appropriate function and purpose of the CCCs with the community, as compared to the non-EVD permanent health facilities. The lack of medicines and trained staffed and the practice of user fees at the nearby PHUs often made visiting CCCs a more attractive alternative for sick community members. PIH worked closely with our partner Wellbody Alliance on the operation of a CHW program that conducted home-based surveillance and referrals, as well as health promotion and messaging to combat these challenges. CHWs reinforced messages in the communities about when to present to a CCC versus a PHU for care to ensure patients received the appropriate care. In addition, PIH worked closely with the lead Clinical Health Officer (CHO) in each chiefdom where the CCCs were located to ensure that staff were prepared to receive patients referred from CCCs when they were determined not to meet EVD case definition.

During feedback sessions, clinicians and stakeholders expressed concerns about the sustainability of the response work, and whether PIH was doing enough to build capacity and strengthen the health system while implementing acute response activities. This became a greater focus of our work as the patient load at EVD-specific facilities decreased and as PIH staff were able to increase time and energy at permanent MOHS facilities, in addition to the temporary EVD facilities. As a result of this effort, both expatriate and local staff noted the significant improvement of the facilities, including improvements in patient flow (e.g., patient registration, triage, waiting areas) as well as overall facility functioning (e.g., cleanliness, waste disposal, pharmacy).

5.4 Coordination with Project Partners

Throughout PIH's response in Sierra Leone, our team has worked collaboratively with other NGO and technical partners on issues ranging from referrals to food distribution to WASH support. PIH entered these partnerships with a true collaborative spirit. The many layers of coordination during the response was often challenging, especially with the large number of partners operating in Sierra Leone during the Ebola response. However, our team made every effort to collaborate with all stakeholders at the district and national levels.

Specific challenges with partnership coordination, which are important to take into consideration for future response efforts, include the division of labor between operational and clinical lead partners in MOHS facilities. As previously discussed, multiple partners operating in one facility can also lead to management challenges.

For example, at the Kono CCCs, the division of responsibilities between PIH and UNICEF produced some challenges. Approximately half of the national CCC staff were paid by the DHMT (through UNICEF support), with the other half paid directly by PIH. This was especially challenging when the DHMT experienced delays with their payroll and struggled to pay CCC staff on time. To prevent tensions among staff, PIH also delayed payment to ensure all staff were

paid simultaneously, which led to frustration among staff and even threats to strike. In the future, PIH would recommend ensuring all staff are on one payroll system to ensure continuity with staff relations and improved efficacy in strong personnel practices. On-time payment also helps maintain staff morale so they feel supported during the ongoing and demanding CCC operations.

Supply chain and M&E arrangements were repeatedly renegotiated between PIH and UNICEF, which was confusing and time-consuming for CCC staff. This was driven in part by high staff turnover--PIH had short-term clinicians rotating through Kono, and UNICEF did not have a consistent presence in Kono District during the program period. This led to repetitive conversations and attempted renegotiation of previously agreed upon operational arrangements by visiting or short-term staff, which confused facility-based staff. For example, at Fiama CCC, which had no cell network coverage, it was agreed that weekly reports by email would be sufficient rather than daily SMS reporting from the PIH M&E Coordinator. PIH received regular requests to senior management and directly to facility-based staff for daily reports, despite previous acknowledgement and agreement in writing that this was not operationally possible. As with the staff payment issue highlighted above, having two partners providing medications and supplies to the CCCs also complicated stock management. Eventually, inventory reporting and daily tracking systems were established in a way that facilitated stock management separated out by donor, but there were still challenges with unexpected shipments of supplies and materials arriving at the CCCs without advanced warning. In the future, PIH would recommend having one partner fully own supply chain management.

Early in the response, there were numerous challenges that required partners to better define their respective roles and responsibilities within each facility, to avoid gaps or duplication of efforts. In the absence of comprehensive MOHS direction on this, partners and donors were often making these decisions on how roles were defined.

Communication and coordination were significant challenges across all aspects of the response, but generally improved over time, both at the district and National levels. Over the course of the grant, PIH improved at regular proactive communication with partners, to flag challenges and operational changes in our programs and seek advice and approval from relevant government and technical agencies as needed. This improved communication was reinforced through strengthening of the DERCs and DHMT partner forums at the district level, as well as strengthening of the NERC. Despite improvements, there were still frequent disconnects in communication between district and central levels, and communication to partners, about critical policy changes. For example, it often took months to get the correct people on email lists and phone trees to receive protocol or facility updates, or be invited to critical discussions and decision-making meetings. As PIH grew its network in Sierra Leone, it became easier to reach out through informal connections to seek out information on critical programmatic and policy questions.

5.5 Engaging Survivors

Building a strong support network for survivors early in the response was an essential part of the success of PIH's clinical and community interventions. Communities seeing their families and friends brought back as survivors greatly improved trust between PIH and communities, and helped restore trust in health practitioners and facilities.

All stakeholders, from CCC nurses to paramount chiefs to survivors, highlighted that referrals from community to facility became much easier once PIH started to support the reintegration of survivors into communities. Survivor accompaniment, engagement and employment should be a cornerstone component of any future outbreak response—both to dissipate distrust among communities resulting in hiding from EVD responders, further exacerbating transmission, as well as to ensure survivors remain connected to care in the critical early convalescence period.

The strong relationships PIH built early with the Kono and Kambia survivor communities have facilitated the rapid scale up of other essential services for survivors as part of the recovery process and ongoing response and risk mitigation efforts. PIH is providing comprehensive medical services to survivors in both districts, including referrals for specialty care, as well as back to school packages for children and literacy and vocational training programs for adults. PIH has also served as the GOSL's primary partner in both Kono and Kambia in the rollout of Project Shield, which is providing sexual risk reduction counseling, condom distribution and semen testing, as a part of the country's risk mitigation strategy.

PIH's survivor program has served as a model for national policy and program planning. PIH is now serving as the lead technical partner to the MOHS in the national scale up of comprehensive clinical services for Ebola survivors.

5.6 Flexibility and Responsiveness

Overall, PIH's approach to working in Kono and Kambia was very flexible and responsive to on-the-ground needs. PIH worked closely with OFDA, the MOHS, and local leadership to develop a cohesive and coordinated response that prioritized the highest need areas in Sierra Leone.

PIH sought to adapt its model as the outbreak evolved, while conducting regular quality assurance checks to evaluate gaps and ways to improve our response (e.g., staffing, management, treatment regimens). To support the needed flexibility and adaptability, PIH leaders ran daily clinical check-ins to review patient files and troubleshoot any challenges. The team always attended meetings hosted by the MOHS and NERC/DERC and then relayed updates to both district and clinical leads to ensure program coordination with stakeholders as the strategy and response plan continued to evolve.

6 MAINTAINING A RESILIENT ZERO BY BUILDING A MORE RESILIENT HEALTH SYSTEM

As the Ebola epidemic has finally been brought under control and acute response activities transition into recovery work, PIH is committed to supporting the GOSL in maintaining readiness and response capacity, as well as building back health systems that will mitigate future outbreaks. Looking forward, PIH is focused on rebuilding trust in the health system, across the continuum of care from community to clinic to hospital, with a focus on maintaining strong IPC practices at all levels of care. PIH will also continue to support EVD survivors as a population with ongoing special medical and psychosocial needs.

Community-level care has the potential to both rebuild trust in the existing health system as well as support early warning systems for future outbreaks via strong linkages to and trust with facilities. Communities can proactively identify people in need of care and connect them to the closest health facility. Survivors are supporting risk mitigation through peer counselling, while also getting needed primary, secondary, and referral care, not through standalone clinics, but with care fully integrated into the public health system. By breaking down parallel systems

through mainstreaming survivor care, PIH will support both long-term health systems strengthening while providing stable care to survivors.

In order to establish this trust and resumption of essential services, facilities must also provide high quality healthcare that ensures the safety and security of all patients and staff. PIH will continue to integrate IPC as a standard part of care at all of our targeted facilities moving forward. PIH will also provide ongoing onsite training and mentorship to facility staff, utilizing real-life and real-time scenarios and clinical experts to reinforce strong IPC practices. Investments made in IPC training and capacity-building with OFDA's support provide a strong foundation for ongoing preparedness and response capacity in Kono and Kambia Districts.

Before the 2014-15 Ebola outbreak, Sierra Leone had some of the worst health outcomes of any country in the world. Ebola devastated an already fragile health system—loss of staff and shaken community confidence in health facilities have led to the further deterioration of health services and outcomes during the outbreak. Ebola survivors need critical time-sensitive care, but many are not being reached by existing piecemeal coverage of primary care services.

Ambitious investments in Sierra Leone's health system in this recovery period will not only mitigate the risk of another Ebola outbreak, but also ensure that the country never returns to the gratuitously high pre-Ebola baseline levels of sickness and death from preventable and treatable illnesses. PIH has successfully supported the governments of Haiti, Rwanda and other countries profoundly affected by poverty, crises and conflict, to dramatically improve health outcomes, and now aims to achieve these same critically important results in Sierra Leone.